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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,479	07/10/2003	David Hyunchul Shim	3123-505	3452

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EXAMINER	
HABERMEHL, JAMES LEE	
ART UNIT	**PAPER NUMBER**
2651	

DATE MAILED: 05/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/617,479	SHIM ET AL.	
	Examiner	Art Unit	
	James L. Habermehl	2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2003 and 13 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,8,10-12,14-17,22,25,26,28,29,32-34,39,41-43 and 45* is/are rejected.

7)☒ Claim(s) *4-7,9,13,18-21,23,27,30,31,35-38,40 and 44* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. This Office action is in response to papers filed 10 July 2003 and 13 January 2004, which papers have been placed of record in the file.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 8, 15-17, 22, 32-34, and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Ge et al. Ge et al. Figures 2-3, 6-11, and 13. Ge et al. meets the limitations of claims 1, 15, and 32, including generating a position signal (y_e) positioning the second member relative to the first member, and reducing a position error in the position signal by non-linear attenuation ($f(y_e)$), wherein the position error is due to a disturbance in the servo system (Fig. 13, d and p).

Regarding claims 2, 16, and 33, the disturbances d and p generate disturbance signals in the position signal as shown by the adders that add u + d and y + p. These disturbance signals necessarily are part of the feedback signal y_b, and therefore of the position signal y_e. Therefore the step of selectively adjusting the disturbance signal as a function of magnitude is included in Ge et al. when it selectively adjusts the position error signal as a function of magnitude (Figs. 3 and 6-11).

Regarding claims 3, 17, and 34, the function has a first selectable parameter representing a threshold level for non-linear signal level adjustment at least at y_s.

Regarding claims 8, 22, and 39, the disturbances d and p generate disturbance signals in the position signal as shown by the adders that add u + d and y + p. These disturbance signals necessarily are part of the feedback signal y_b, and therefore of the position signal y_e. Therefore the step of selectively adjusting the disturbance signal as a function of magnitude is included in Ge et al. when it selectively adjusts the position error signal as a function of magnitude (Figs. 3 and 6-11). As shown by its parabolic shape, the attenuation of the disturbance signal increases as a non-linear function of the magnitude of the disturbance signal.

4. Claims 1-3, 8, 10-12, 14-17, 22, 25-26, 28-29, 32-34, 39, 41-43, and 45 are rejected under 35 U.S.C. 102(e) as being anticipated by Ho ('472). Ho ('472) Figures 7-8 meet all the limitations of claims 1, 15, and 32, including generating a position signal (PES) positioning the second member relative to the first member, and reducing a position error in the position signal by non-linear attenuation (710, EQ. 3), wherein the position error is due to a disturbance in the servo system (NRRO Disturbance in Fig. 7).

Regarding claims 2, 16, and 33, signal d in Fig. 7 is a disturbance signal generated by a disturbance, and Fig. 8 shows selectively adjusting the disturbance signal as a function of the magnitude of the disturbance signal.

Regarding claims 3, 17, and 34, mode controller 706 controlling switch 716 has a first selectable parameter representing a threshold level for non-linear adjustment.

Regarding claims 8, 22, and 39, signal d in Fig. 7 is a disturbance signal generated by a disturbance, and Fig. 8 shows selectively adjusting the disturbance signal as a function of the magnitude of the disturbance signal. Signal u magnitude increases as a non-linear function of the magnitude of the disturbance signal (Eq. 3), which is then subtracted from the controller output, thus increasing the attenuation of the disturbance signal.

Regarding claims 10, 24, and 41, band pass filter 704 selectively passes the disturbance signal, which is then used to generate a correction signal which is combined with the position signal to generate a corrected position signal, as described above, thereby reducing the position error in the position error signal.

Regarding claims 11-12, 25-26, and 42-43, col. 8, lines 1-4 show determining the frequency band of the disturbance signal, and then filtering the position signal to selectively pass the disturbance signal, where a peak filter is a narrow band pass filter.

Regarding claim 14, 28, and 45, signal u magnitude increases as a non-linear function of the magnitude of the disturbance signal (Eq. 3).

Regarding claim 29, col. 8, lines 1-4 show the attenuator includes first and second filters and gain controllers which then would necessarily combine the first and/or (see col. 8, lines 4-8) second correction signals with the position signal, thereby reducing position errors in the position signal.

5. Claims 4-7, 9, 13, 18-21, 23, 27, 30-31, 35-38, 40, and 44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form

including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

Claims 4, 18, and 35 are allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a servo system, a method for operating a servo system, and a disk drive comprising adjusting the disturbance signal as a non-linear function of the ratio of the amplitude of the disturbance signal and threshold value N, as presented in the environment of claims 4, 18, and 35. It is noted that the closest prior art, Ho ('472), shows a method similar to the claimed invention. However, Ho ('472) fails to disclose using a ratio of the disturbance signal and the threshold value as claimed.

Claims 9, 23, and 40 are allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a servo system, a method for operating a servo system, and a disk drive comprising said function is an odd function, as presented in the environment of claims 9, 23, and 40. It is noted that the closest prior art, Ho ('472), shows a method similar to the claimed invention. However, Ho ('472) fails to disclose using an odd function as claimed.

Claims 13, 27, and 44 are allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a servo system, a method for operating a servo system, and a disk drive comprising determining the magnitude range of the disturbance signal and filtering the position signal using a peak filter based on the magnitude range of the disturbance signal, as presented in the environment of claims 13, 27, and 44. It is noted that the closest prior art, Ho ('472), shows a method similar to the claimed invention.

However, Ho ('472) fails to disclose using a magnitude range of the disturbance signal as claimed.

Claim 30 is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a servo system comprising a saturation filter that limits the output of the attenuator to preserve servo-loop stability as the gain controller output increases above a threshold, as presented in the environment of claim 30. It is noted that the closest prior art, Ho ('472), shows a method similar to the claimed invention. However, Ho ('472) fails to disclose using a saturation filter as claimed.

Claim 31 is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a servo system comprising a deadzone controller that filters the output of the attenuator to preserve servo-loop stability as the gain controller output decreases below a threshold, as presented in the environment of claim 31. It is noted that the closest prior art, Ho ('472), shows a method similar to the claimed invention. However, Ho ('472) fails to disclose using a deadzone controller as claimed.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ho ('219) Figures 7-8, Ho ('376) Figures 7-10, Ryan Figures 4-7, Sidman Figures 3-7, Romano Figures 8A-9, Zhang et al. Figures 6, 9, 12, and 15, and Sheh et al. Figures 1 and 3-5 show reducing the position error due to a disturbance in the position signal.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James L. Habermehl whose telephone number is (571)272-7556. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571)272-7843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Habermehl/jlh
24 May 05

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